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706785US1

### **Remarks**

Claims 1-14 remain pending in this application. Applicants respectfully request reconsideration in view of the following comments.

In the Office Action, claims 1, 3, 5-7, 9, and 11-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Maida, Jr. (U.S. 20040113104 A1, hereinafter referred to as Maida"); claims 2 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Maida in view of Bryant (U.S. 5,557,995); and claims 4 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Maida in view of Cohn (U.S. 5,422,405). Each of these rejections is respectfully traversed as follows.

Maida discloses a fiber-optic-based arrangement for monitoring physical parameters that achieves certain advantages by using a remotely deployed circulator coupled to the system by way of separate forward and return fiber-optic lines. More specifically, such an arrangement is disclosed as greatly expanding the distance for which such optical sensing systems can span.

In contrast, independent claim 1 requires a light pipe "formed from a material having a refractive index higher than air's refractive index and less than or equal to said liquid's refractive index." Applicants' remaining independent claims, 7 (a plurality of light pipes) and 13 (a bundle of optical fibers), likewise require a similar limitation. While the Examiner expressly acknowledges that Maida does not disclose use of a material having a refractive index higher than air's refractive index and less than or equal to the liquid's refractive index (noting also that the Examiner has overlooked the fact that Maida also does not disclose the use of a light pipe, a plurality of light pipes, or a bundle of optical fibers as expressly required by claims 1, 7, and 13, respectively), the Examiner sets forth the position that "[i]t is well known" to form a pipe from a material having such a refractive index arrangement. The Examiner further holds that it would have been obvious to one of ordinary skill in the art to form the pipe from a material having a refractive index higher than air's refractive index and less than or equal to said liquid's refractive index "to prevent the lost (sic) of data during the transmission." Applicants contend that the Examiner's position is conclusory and technically inaccurate.

More specifically, Applicants' initially point out that Maida is completely silent as to the refractive index of fiber optic cable 28 (or other optical fibers such as 42 and 46). In addition, none of the other references made of record disclose nor suggest an arrangement having a refractive index arrangement as expressly required by claims 1, 7, and 13, and the Examiner

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points to no other teaching in the prior art. As such, the record is devoid of any support for the finding that "it was well known" to form a pipe from a material having a refractive index higher than air's refractive index and less than or equal to the liquid's refractive index.

Furthermore, Applicants' note that nowhere does Maida ever suggest that the fiber optic cable does anything more than communicate data between surface instrumentation 16 and a downhole sensor assembly 34. As such, there would appear to be no reason that the refractive index of the fiber optic cable would be equal to or less than a liquid's refractive index. Simply stated, Applicant's claimed invention advantageously uses such a refractive index arrangement to allow light from a light source to remain in the light pipe (or optical fiber) when the light pipe (or optical fiber) is surrounded by air, but to allow the light to escape the light pipe (or optical fiber) when the light pipe (or optical fiber) touches a liquid to be measured. Contrary to the Examiner's assertion, such an arrangement would not prevent the loss of data during transmission. In fact, if the cable of Maida was so arranged, and the cable passed through a liquid being measured, none of the data generated by the sensor would pass through the cable (i.e., it would escape through the liquid).

Regarding Bryant and Cohn, neither reference overcomes the deficiencies noted above with respect to Maida. More specifically, Bryant is silent as to refractive index, and Cohn passes light through an environment, and detects the presence of fluids in the environment as a result of sensing degradation of the internal reflectance of the light within a light guide. Again, none of the references, whether considered alone or in combination, provide any suggestion whatsoever for a light pipe (or optical fiber) formed from a material having a refractive index higher than air's refractive index and less than or equal to the refractive index of a liquid to be measured. Accordingly, Applicants assert that claims 1, 7, and 13 are allowable as originally filed.

With respect to dependent claims 2, 4, 8, and 9, Applicants initially note some confusion as to the why claim 9 stands separately rejected over Maida by itself, as well as the combination of Maida and Cohn. Notwithstanding and without conceding the Examiner's position as set forth in the Office Action, Applicants contend that each of these dependent claims are likewise allowable due to their dependency from claim 1 or claim 7.

From the foregoing, Applicants submit that the remaining claims in this patent application are now in condition for allowance. Accordingly, reconsideration of the claims and passage of the application to issue are courteously requested. If a telephone conference would expedite

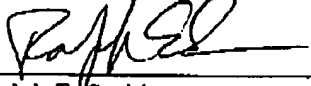
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allowance or resolve any further questions, such a conference with the undersigned is invited at the convenience of the Examiner.

Respectfully submitted,

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